

## Students tackle West Nile virus and invasive plant research

Two student researcher teams at NASA Ames are working to prevent the spread of West Nile Virus and foreign weed growth this summer, thanks to a new educational program called DEVELOP.

Started in 1998 at Langley Research Center, DEVELOP stands for Digital

program director and Cindy Schmidt of California State University is the program coordinator.

Using the Eastern Range Dispersion Assessment System (ERDAS) Imagine software, the two student teams use satellite imaging to geographically identify target areas in their projects.

The first team is working with the Monterey County Health Department monitoring vector-borne diseases, namely the West Nile virus. The satellite technology helps the students identify areas in the county where a West Nile carrier, the *Culex* mosquito, is likely to live.

"We can't identify individual bodies of water at this resolution," Emily Clary, a graduate student at the

University of New Mexico, said of the software. "So we look for high vegetation levels, which will likely be an area with a lot of water."

The students also go into the field to identify the mosquito species in select areas. Once the data is collected, Baliff will combine their findings with demographic data.

"The elderly are high-risk (for fatally contracting the disease)," Baliff said. "I'm looking for assisted living, nursing homes, even golf courses—places where the elderly are likely to be."

Once the study is completed, the students will hand over their findings to the Monterey County Health Department so that it can prepare for and prevent the West Nile Virus from inhabiting the identified high-risk areas.

The second student team is working on an invasive plant species management system with the Pyramid Lake Paiute Tribe in Nevada. Skiles and Schmidt selected this project because of the potential to build a relationship between the two organizations.

"Whenever a government agency can work with a tribal council, that rings bells," Skiles said.

The team visited the reservation,

that, since a 1997 flood, has had an increase in weed growth. One of the main species they will target is the tall white top, a plant native to the Mediterranean region.

Based on their plant identifications on the ground, the students will use satellite images to identify the spectral 'fingerprint' of the plant they found in that area. Then, they will single out other nearby regions using the images where that same fingerprint appears. This means the same plant is in those regions as well.

"Different weeds have different reflection properties," explained Jeremiah Knoche, an Oregon State University graduate student. "By comparing different reflective bands, we can identify the different species."

Once their research is complete, the students will create a database for the tribal council to use.

"The Paiute tribe is looking for a way to document where the weeds have historically been and where they can go," said Douglas Gibbons, a Utah State University graduate student. "Our ultimate goal is to provide them with the necessary information they need to make management decisions, like how much cattle can graze in an area or pesticide control. It's helping them know what to do with their land."

The projects are giving the students valuable experience using up-to-date software, as well as true leadership and independence. The DEVELOP program motto is 'student run, student led,' so Skiles and Schmidt help only when necessary.

"I'm totally excited about this," said Alex Hogle, an undergrad at the University of Utah. "I'm hoping to go back to Utah and apply what I have learned here."

Lakshmi Karra, a student from Gunn High School in Palo Alto, said that she is also excited because the team is doing service for the community.

"I think the ecosystem gets overlooked sometimes, but it's a very important area of study," she said.

The students were chosen on application processes. The high school students filled out applications and Skiles and Schmidt did subsequent interviews. The college students applied through their state governors. Skiles said the program is going well so far.

"The students are so exciting to work with," he said. "They think outside the box, and it's a real two-way street."

BY ALISON MARTIN



NASA photo courtesy DEVELOP Team

DEVELOP students Elizabeth Ballif and Emily Clary check standing water for mosquito larvae in Salinas, California.

Earth Virtual Environment and Learning Outreach Project. Former Vice President Al Gore began the program, whose goal of which is to give students hands-on experience with immersive visualization technology.

Nine students are working on a West Nile Virus preventive study in Monterey County and a study of invasive plant species (weeds) on a Native American reservation in Pyramid Lake, Nev. The state-of-the-art, remote-sensing technology they are applying uses satellite and aircraft images to deduce surface conditions quickly and cost effectively. Most students never use it until graduate school, a fact that attracted many of the students to the program. But the prestige associated with NASA didn't hurt either.

"Of course, to work with NASA is a big thing," said Elizabeth Ballif, an undergraduate student at the University of Utah. "It's technology I haven't worked with, but they said they'd train me. So I said, 'Get trained by NASA? Sure, sign me up!'"

Three high school, three undergraduate and three graduate students make up the program. Jay Skiles, NASA Ames' senior research scientist, is the